N.A.C.A. BULLETIN

In Three Sections

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VOL. XXX, NO. 3 OCTOBER 1, 1948

EDITORIAL DEPARTMENT NOTE

A budget is neither law nor fate but must, itself, be governed by operating facts. In the early days of budgeting, the industrial accountant often played a lone hand and as often as not "desk budgets" not highly regarded by others resulted from his pioneer efforts. Today budgeting is widely recognized as a necessary part of teamwork within an organization. This attitude is well reflected in the first article in the present issue, which outlines a general procedure for building a budget incorporating the best judgment of supervisory personnel throughout the company.

The author of the article is NORMAN H. GROSS, a Registered Accountant practicing in Denver, Colo. Mr. Gross has held responsible accounting posts with the government and in private industry. He was formerly Assistant Chief Accountant of Boeing Aircraft Co.

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The A B C's of budgeting are not always as simple as such a designation would imply. To be more specific, budgeting sometimes becomes complicated in application. Accordingly, a careful statement of procedures which will result in establishment of sound and workable budget allowances and reports is very welcome. Such a statement, weighted toward the side of flexible budgeting, is afforded by the second article in this issue.

E. J. HOCKSTAD, the author of the presentation, is Financial Vice President of LaSalle Steel Co., Chicago, Ill. Mr. Hockstad occupied the post of Controller with the Aero Div., of Minneapolis-Honeywell Regulator Co., during the war period and the present article resulted from this experience. Mr. Hockstad has also occupied the position of Controller with Freuhauf Trailer Co., Detroit, Mich., and Esquire, Inc., Chicago, Ill.

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A budget is an advance (even if flexible) measurement. It is no wonder, therefore, that in many cases its application is dependent on development of specific techniques. Measuring bases are not always easy to find. In the course of our third article, it is apparent that motion picture theatre operators have a special problem in this connection, especially with respect to the measurement of promotion expense. The presentation makes considerable progress in the direction of the solution of this problem.

The article is offered by RAY A. HOWARD, JR., a C.P.A. in Illinois, and a graduate in accounting from Northwestern University, now engaged in practice with the firm of William E. Krieger, Peoria, Ill., and in teaching accounting. As the son of theatre-operating parents, Mr. Howard brings personal as well as professional interest to his subject.

This *Bulletin* is published semimonthly by the National Association of Cost Accountants. 385 Madison Ave., New York 17, N. Y. Subscription price, $10 per year. Entered at the Post Office, New York, N. Y., as second-class matter August 28, 1925, under the Act of March 3, 1879.

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October 1, 1948

BUDGETING PLANNING OF MANUFACTURING OPERATIONS

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HAPPILY, it is no longer necessary to preface a paper on the subject of budgeting with argument for the value of budgetary activity. Even though it was not always so, it is now pretty generally recognized that the operation of a business without a budget (and it makes no difference whether the business is large or small) is akin to building a house without a blueprint, or to conducting a military campaign without tactical and strategic plans. Budgetary planning provides management with a program based on investigation, study, and research on the part of the entire organization which has come to be recognized as an essential of good management.

Since the budget represents the ultimate in the accountant's opportunity for service at top executive level, the accountant must never lose sight of the fact that budgeting is a cooperative procedure, involving every segment of the business. Individual temperaments and characteristics of numerous department heads must be given full consideration. To achieve successful results, it is imperative that the budget represents the best thought of all responsible executives of each phase of the business. The department heads must do sufficient preliminary work on the individual departmental budgets to have a feeling of interest in, and responsibility for, any variance between budgeted and actual operations.

Points of Departure for Effective Budgeting

Proper budgetary planning requires sound organization, proper accounting classification and records, adequate research, and perhaps most important of all, support from top-line management. Regarding organization, the process of budgeting will reveal weaknesses in the organizational structure and point out needed changes. Definite lines of authority and responsibility are a primary requirement for any system of budgetary planning. Generally it may be said that satisfactory results from budgetary planning require decentralization of authority and responsibility, which should rest as nearly as possible at the point of activity.

It goes without saying that a background of reasonably accurate and comprehensive accounting records is necessary to provide a reliable basis for the budgetary planning of the company. The records must make possible the determination of relationships existing between various items of cost, the relative status of departmental and functional breakdowns, as well as established trends in operations and financial matters.

However, budgeting deals with the future and it follows that the records of past operations provide only a starting point. In addition to knowledge as to what has happened, we must also know what future actions may be expected, and their probable results. New processes, new opportunities—all must be taken into account in planning the budget.

A prime requirement for the capable direction of the budget preparation—budgetary procedure—is the fixing of responsibility both for the over-all budget and its individual components. This will probably best be accomplished through the budgeting committee, composed of department heads or their delegated assistants and presided over by the budget director. The most important function of the budget director will necessarily be to instill confidence in and obtain full cooperation from the operating department heads. A large portion of the work must necessarily be delegated to nonaccounting personnel and it is at this point that budgeting faces its major test. Unless the basic forecast information of a nonaccounting nature is soundly prepared, the accountant may use perfect procedures, techniques, and logic in translation of the basic data, but the result will still leave much to be desired.

The matter of the length of the budget period is one that will be decided based upon individual industry conditions and company plans. To some extent, at least in the matter of fixed asset additions, thought will be given to periods of many years. (This might well be compared with the military concept of "strategic" planning.) Other elements of the budget should be projected for such periods as permit reasonable predictions of conditions. In most cases it should be possible to prepare complete budgets for at least quarterly periods and preferably longer. (These short-term and more particularized plans are called "tactical" by the military.) The ideal situation might be a continuous program of budgeting for a year ahead, either on a monthly or quarterly program, with revisions being made currently as dictated by changing conditions.

Sales Budget

In one sense, many of the primary objectives of budgeting are at least partially accomplished by the mere preparation of the budget —in the process of which management must give consideration to all factors affecting the business and must analyze projected undertakings and policy changes with full consideration being given to foreseeable results. In the final analysis, the budget is based on *external* nonaccounting considerations. Somewhere along the line a fundamental forecast must be made regarding probable general business conditions for the future period covered by the budget.

This forecast must be interpreted in terms of probable sales—in sufficient detail by products or product categories to furnish a proper basis for what might be termed the *internal* budget. Such a forecast will ordinarily require considerable research of a nonaccounting nature and will, of course, ordinarily require full approval of the president himself. Given such a sales forecast, the dollar effect of anticipated sales volume and changes in sales policies and methods is normally evaluated in budget terms by the budget director or accounting officer of the company.

Production Volume Budget

After preparation of the sales forecast, the next normal step would be preparation of a production volume budget, the primary objective of which is planning the actual production of the material estimated to be required to meet the budgeted sales. In connection with the preparation of production volume budgets, answers must be evolved to such questions as maximum utilization of plant facilities and labor, inventory control, capital asset requirements, etc. To accomplish desired results, it is advisable first to prepare a flow chart showing time normally required to:

a Get raw materials into the plant.
b Have various components fabricated.
c Assemble, inspect, and deliver finished products.

Based upon the time lapse required in any given field, it is then possible to set forth (with some allowance for unavoidable deviation), the dates upon which production must start in order to fulfill both firm commitments and anticipated orders.

In preparing the production budget, an attempt is made to budget production and flow of raw materials in such a manner that inventories are maintained at lowest practical levels in consideration

of the company's operating policies and at the same time to take advantage of quantity buying to whatever extent it is feasible. It is likewise advantageous from the standpoint of production planning and plant utilization, to plan production more or less evenly over the entire period, even though sales may be highly disproportionate during certain months or seasons.

Despite this, we must all agree at the outset that we cannot have minimum inventories and stabilized production at the same time. If we are to keep a stable production in an industry that does not have relatively stable sales volume, finished goods and work-in-process inventories and working capital requirements will naturally fluctuate. Quantity purchasing will have a similar effect on raw material inventories. We thus come to the important and sometimes perplexing alternatives of stabilizing inventories or production. Which path to follow and to what extent must depend upon individual company conditions and the application of sound judgment and analyses. Minimum inventories are desirable because they tend to reduce investment and expenses such as insurance, property taxes, handling costs, etc., and reduce risks of spoilage and price declines or changes in demand. On the other hand, the stablization of production makes it possible to produce more goods with less plant, to produce in quantities found most economical, and to utilize both labor and equipment to best advantage.

In this connection, it is sometimes advisable to prepare preliminary production budgets showing the financial and cost effects of both a stablized production volume, wherein the anticipated number of units is produced evenly over the entire period (regardless of sales), and one based on minimum inventories. The management may then see the effects of both procedures and weigh the relative merits of each. The result may quite possibly be a compromise best suited to the individual company's operations.

Production Cost Budget

In discussing the production cost budget, let us assume that a standard cost system is in use. The conversion of production units to production costs requires only extension at standard costs plus variances due both to volume production rates during given months and other factors disclosed by analysis of the production volume budget. To the basic cost determined from the standards, we will have to add adjustments, based on variable and semivariable items.

At this point the chief cost accountant and the budget director should carefully analyze all of the standards, together with variances developed in the preceding period, and make such adjustments to the standards as appear proper after consideration of circumstances involved. Changes in production methods and procedures often take place in the factory without immediate knowledge of the cost accountant. All proposed changes in the production process for the budgeted year should be carefully analyzed so that their effect on production cost can be calculated. Changes in material indexes, labor contract expirations, and other items of a similar nature, should be analyzed and their probable effect likewise computed so that the final production cost budget will reflect the best judgment of all informed officials of the company.

Material Budgeting

The material purchase budget will of necessity be governed primarily by the policy decided upon respecting inventory or production stablization. The timing of purchases and considerations as to quantities, stocking, etc., will thus have been predetermined in connection with the production volume budget. Regardless of the nature of material purchase control, whether it be detailed, accomplished through stock limitations, or based on specific commitments, the dollar estimate by months must form an integral part of any system of budgetary control. This dollar estimate is one of the primary requirements for the forecast balance sheet and will reflect in the inventory, accounts payable, and the cash requirement necessary therefor.

Inventory Budget

The matter of inventory requirements has been covered previously as far as raw materials and supplies are concerned, but the budgeting of finished goods and work-in-process inventories is worthy of considerable attention. The control of work-in-process inventories is a fit subject for a great deal of study, involving such questions as shortening of the production cycle, desirability of increasing inventories of fabricated standard parts and assemblies in order to reduce the inventory of finished goods, and exercising of control over hidden inventories, i.e., the individual shop's secret backlog for use in case of emergencies.

Budgeting of the finished goods inventory should be accomplished product by product and should be based upon the sales

forecast and company policy regarding inventories versus stabilized production, as reflected in the production volume budget. The inventory control plan adopted should be continuously scrutinized and must be extremely flexible so that inventories may expand or contract rapidly, depending upon fluctuations in demand.

Labor Budget

The detailed production budget with its labor breakdowns and labor standards should, in addition to providing cost of direct labor, provide for meeting production schedules. Labor unions, the government, and almost everybody else is paying much attention to the "social" implications of stabilized employment. It might reasonably be suggested that retention of employees for social reasons only might well lead the management of a given company to the point where it too will need "social" help. Management's prime consideration must be the efficient utilization of labor, and this is often best accomplished by stabilization of employment. Fortunately perhaps, this will ordinarily coincide with the "social" objective, but it must in each case be balanced against the risks and costs of maintaining excessive inventories of finished goods produced in slack sales periods.

Information on requirements for indirect labor will be secured from departmental budgets and the resultant combination should permit intelligent personnel planning.

Expense Budget

The preparation of an expense budget assumes the prior determination of proper measures of productivity. The control of expenses is normally more difficult than any other phase of budgetary planning because of the variety of dissimilar items of cost and the distribution of responsibility for resulting variance.

In all phases of control accounting, it is axiomatic that costs are controlled by individuals. If the account classification is not such that some one person is responsible to the greatest extent possible for each individual item of cost, much of the work performed is wasted. For budgetary control purposes, the account breakdown must fit the organization chart of the company. Special subaccounts should be provided to accumulate the expenses for each supervisor who is in a position to incur and/or cause expenses, providing sufficient detail to allow adequate analysis for the unit. Even the indirect service departments must be charged for those expenses

over which the department head exercises control even though such expenses will be prorated to other departments or operations.

In setting up the expense budgets, great care must be used so that the setup will lend itself to current reports which can be delivered to the foreman level, showing both budgeted and actual costs incurred, in a manner that will be readily understood and appreciated by the production or service personnel involved. The successful operation of any expense budgetary program will be judged solely by the degree to which the budget is understandable to and used by the operating personnel in its detailed aspects. Every effort should be made to devote as much time and attention as possible to the budget development work done by the individual operating unit supervisors.

Flexible budgets are set up on the theory that certain elements of cost fluctuate with the rate of production while others remain constant. These fluctuating cost items are further refined into variable and semivariable elements. Examples of fixed expenses might include executive salaries, depreciation, property taxes, amortization charges, certain insurance charges, rent, research and development, etc. Semivariable costs might include maintenance, supervision, administration expenses, clerical, personnel, inventory handling, engineering, heating, janitorial expense, etc. Variable manufacturing expense normally includes supplies, power, royalties, small tools, salvage, inventory variance, receiving and shipping, etc. The classification of expense items into fixed, variable, and semivariable must follow the pattern dictated by the individual company's operations. Logical analysis of burden items and their relationship to production volume will furnish the only sound classification basis.

In conjunction with classification of burden items, it will again be necessary to establish measurement units for use in budgeting both variable and semivariable items of cost. In producing departments, the unit of measure would normally be based on a potential operating capacity. Once the potential operating capacity of a department has been set, other rates of operations can be stated either in terms of percentage of potential or machine or direct hours. Since service departments normally do not lend themselves to such an exact unit of measure, it will ordinarily be necessary to set standards for these departments based on activity of productive departments. Some service units might best be measured in terms of over-all productivity of the plant while others should be stated

in terms of productivity in certain shops or departments which they service.

Departmental Expense Budgets

The departmental budget should be developed by budget personnel working in conference with individual foremen and subject to the approval of the plant or works manager. The cooperation of the foremen in the development of the standard allowances is considered essential, since it is desired that the foreman will assume a degree of responsibility for his share in meeting or bettering his departmental expense budget. The setting of the budgets, especially at the outset, will require a great deal of preparation and analysis of past data in order to arrive at a usable basis. The matter of setting formulae for the development of expense allowances of various categories at the various levels of productivity requires individual analysis. The various methods commonly in use can be found in numerous reference works. Care should be exercised to apply variable and fixed items of semivariable costs so that reports of operations showing variation from budgeted costs will reflect only those items subject to control.

Once the preliminary budgets have been prepared, the next step involves item-by-item analysis by both the budget director and the unit supervisor involved. This analysis should be sufficiently detailed so as to question each item and classification of expense, to seek out duplication, methods of work simplification, usage of supplies, facilities, etc. The foreman should have a complete understanding of the budgeted amount for each classification of fixed expense chargeable to his unit, as well as both the fixed element of semivariable expenses and the basis for the variation of each variable expense and variable portion of the semivariable items. The method used in arriving at the variable factors should be gone over in detail with the foremen and adequate consideration should be given to any comments the foremen may make as to the application of the method used in any given instance. Quite often the individual unit supervisor will be able to provide sounder methods for setting standards for variables. Once the budget has been approved by the unit or departmental head, it is ready for submission, through channels, to the top executive responsible for that part of the company's operations, and thence through the budget committee to the top executive of the company as a portion of the final budget program.

Administrative Expense Budget

The matter of administrative expenses is too often slighted in budgetary planning since the administrative expense budgets are normally prepared by the accounting executives who themselves are often prone to feel that control is necessary everywhere except in their own backyard. In many cases, budgets for administrative expense are prepared simply by taking past experience and making allowance for additional projects and salaries desired. If the budgetary planning program is to be truly effective, the budget office would do well to go into at least as much detail in the preparation of the budget involving its own familiar surroundings as those involving the shop groups. Forms in use, reports issued, clerical and office procedures, should all be analyzed and may provide as great a savings potential (at least proportionally) as exists in the shop.

Analysis of each unit of the administrative division of the company, both as to its functions and methods, is desirable. Elimination of unnecessary overlaps, simplification of work, reduction in personnel requirements, and greater utilization of reports and records are the desired ends. This is especially important in view of the fact that a budgetary plan entails considerable additional work on the part of the administrative personnel and every effort should be made, at the same time, to eliminate or simplify other operations where possible.

Combination of Budgets Into the Operating Budget

The sales, production, and expense budgets form what is known as the operating budget. This budget covers the general operations of the company as a whole, and must be so interrelated as to form an integrated program for the company. Each change in producing shops or departments will have an effect upon other segments of the company and care must be taken in the preparation and consolidation of individual departmental budgets to see that everything ties in and that no duplications exist. For example, expense items budgeted under a maintenance department budget may be found to be included again in the budget of the production department.

The responsibility of the budget director must include approval of the particular basis of cost analysis which will best serve budgetary purposes, whether or not the basis is the same as that used

for cost and other accounting purposes. The operating budget should be so constructed that it will readily lend itself to monthly or other periodic reports which will not only show variances by individual responsibility, but which will lend themselves to a complete detailed analysis as to causes of the variances. The current issuance of a statement of variances in itself will be of little value to management. Variances due to either unusual efficiency or inefficiency must be highlighted in such a manner that management will be currently aware of the items, their nature, their possible causes, and the individuals involved. Where feasible, budget reporting should be organized to give the foreman of each individual shop a report, at least weekly, showing the detailed results of his departmental operation compared with the standard. Reports to the production manager or other higher levels of management would normally be required only on a monthly basis, although this is a matter which should be worked out in the budget committee so that the organization leaders will get the information they need for proper control as promptly, as frequently, and in such form as will best accomplish that objective.

Financial Budgeting: Plant and Equipment

Once the operating budget has been arrived at, a forecast profit and loss statement is virtually complete and the forecast balance sheet may be completed. Planned changes in fixed assets are analyzed and the cash forecast is prepared.

In manufacturing, due to the relatively heavy investment in fixed assets, the plant and equipment budget is one of the most important segments of the budgetary planning program. The function of fixed asset budgeting is to subject all proposed capital expenditures to all reasonable tests as to probable consequences from both the operating and financial viewpoints for the projected period of utilization of the asset. In developing the plant and equipment budget, it will normally be broken down into replacements for existing items, extension of or addition to existing facilities, completely new additions, and relatively minor improvements to existing facilities.

The production volume budget should, of course, take into account planned changes in equipment, of any size, and their probable effect on costs. With this information at hand, the preparation of the fixed asset investment budget should be relatively simple.

The justification for all investments having been carefully considered and the investments themselves determined within reasonable limits, the budget director, together with the budget committee, can work out the cash requirements based on anticipated deliveries on new capital items and, on this basis, the budget director can also forecast the fixed asset account month by month on the balance sheet.

Requests for additional plant and equipment items will normally originate in the respective departments, and should, in addition to the project description, show the classification of the addition, justification for expenditure, and summary of estimated cost and recovery value of discarded assets. Both the engineering and the cost accounting departments would work out the cost and operational studies showing the probable effect of the requested addition, and the budget committee can then decide as to advisability and feasibility of the addition. Availability of funds decisions will, of course, be made by the top financial officers of the company.

Cash Budgets

The cash budget or forecast is actually a translation of the operating budget in terms of anticipated receipts and disbursements. The functions required are normally performed by either the budget director or one of the accounting executives of the company and are limited to summarizing cash receipts and disbursements indicated by the operating budget, together with consideration of receipts and disbursements not directly related to the operation of the company. These might cover anticipated action with respect to investments, loans, dividends, fixed asset changes, and changes in capital structure. Such items will normally be forecast by the treasurer and reviewed by the board of directors. Preparation of the cash forecast, in addition to estimation of time lag of receipts from sales and of payments for purchases and expenses, requires consideration of effects on each of the nonoperating items previously mentioned. In the matter of cash receipts forecasting, consideration must be often given to both the normal collection period required and seasonal differentials. Where the firm's business is rather stable, it is usually possible to use an average turnover basis for estimating collections from sales made in any given period. In many industries, however, the highly seasonal pattern of delivery to ultimate consumers reflects in the ability of manufacturers' customers to make payment for delivery, and receipts of the manufac-

turer will thus often follow a seasonal pattern similar to that shown by ultimate sales to consumers. At any event, the basis for forecasting receipts from sales will, of necessity, be the past experience of the individual company as modified by any known changes in conditions or terms of sale or customer classifications.

The forecast of disbursements will be prepared based upon the production cost budget, the purchase and payroll budgets, expense budgets, and the extraneous items taken from the plant and equipment budget, together with any planned financial transactions. In addition to the known factors resulting from previously prepared budgets, the normal credit terms encountered by the company must be considered, as well as its policy with respect to payment. After preliminary cash forecasts have been prepared, they should be reviewed by the top financial officers of the company and adjustments made so that financial planning will result in the most efficient utilization of company funds.

With both the operating budgets and financial budget to work from, the forecast balance sheet will fit together like pieces of a jig-saw puzzle. Most of the balance sheet items will have already been considered in connection with the financial planning and cash forecasts, and few additional factors are required. Some transfers between balance sheet accounts will be necessary and noncash items will have to be properly reflected.

Tools of Administration and Control

The value of presenting monthly to top management budgeted operating statements by months for the entire budget period together with monthly forecast balance sheets and profit and loss statements can hardly be overstated. When these steps are coupled with monthly comparisons between budgeted and actual operations and budgeted and actual balance sheet positions, including explanation and analysis of major variances, management is provided with an invaluable tool with which to perform its job of administration and control. Importance of this and any other aids to sound management can be expected to increase greatly with the completion of the transition from an economy still ridden by war-born shortages to the more normal conditions of intense competition already manifest in some lines. Today is none too early to begin to prepare for such a time; tomorrow may well be too late. Accountants in the industrial field have never had a greater opportunity to demonstrate the value of their contribution to the management process.

DYNAMIC BUDGETING FOR COST CONTROL

by E. J. HOCKSTAD,
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WE all know we can meet lower selling prices only by having lower production and operating costs if we want to maintain profit margins. The control of manufacturing, operating, and distribution costs is therefore a major problem in the development of selling prices with satisfactory profit margins. Although expense control with a variable budget will not guarantee or insure profits, it provides a plan whereby operating hazards or excess costs can be easily recognized so that action can be taken to correct unfavorable operating conditions which have been materially reducing the profits, or increasing the losses. Generally speaking, this form of budget provides for an allowed cost for each element of expense and establishes a basis by which management and supervision can compare the budgeted and actual expenses so that excess costs can be determined for daily, weekly, or monthly operating periods.

How Costs Behave

Thorough consideration must be given to the effect of expenses which are fixed or constant and do not change with production volume and those expenses which vary with any change in production output. Otherwise allowances for budgeted expenses may be overstated and extra costs incurred which were not anticipated, resulting in decreased profits. Fixed costs are those expenses, such as rent, insurance, depreciation, and taxes, which are required for any level of production volume. These expenses are not usually increased or decreased by changes in production volume but remain constant within a range over a *selected period of time.* Variable costs are those expenses or costs which are affected by changes in production volume and vary proportionately with corresponding increases or decreases in direct labor or production output. Direct labor and direct materials are examples of variable costs. There are certain classes of expenses which contain elements of both fixed and variable costs, which may be described as semi-variable expenses. Examples of this type are supervision, manufacturing supplies, factory clerical salaries, and maintenance costs.

When changes in production volume occur, it is the *combination* of these fixed, semivariable, and variable expenses which change the unit cost of processes and products so that profits from operations seldom increase or decrease in direct proportion to dollar sales volume. With a variable operating budget that segregates these elements of costs into understandable relationships, it is possible to project allowed costs and operating expenses for any level of production or sales, and to determine the profit contribution by divisions, product classification, or special projects.

In order to illustrate the effect of fixed and variable expenses upon unit cost of product, let us assume that a man opens a small factory and has two expenses: direct labor—which is considered variable—and rent, as a fixed cost. The effect of these costs upon production is shown in Exhibit 1 for 1,000 units, 2,500 units, and 5,000 units per month.

ANALYSIS OF MANUFACTURING COSTS ON FIXED AND VARIABLE BASIS

	1,000	*2,500*	*5,000*
Production units			
Direct labor	$1,000	$2,500	$5,000
Fixed Cost			
Rent	5,000	5,000	5,000
Total	$6,000	$7,500	$10,000
Cost per piece	$ 6.00	$ 3.00	$ 2.00
Selling price	3.00	3.00	3.00
Net Profit or (Loss)	$(3.00)	–0–	$ 1.00

EXHIBIT 1

Two things can be learned from this projection. First, the direct cost per unit did not change regardless of the volume of production and can be accurately predicted, from (say) a time study standard, as $1 for each unit of production. We also know that, irrespective of the volume of production, there will be a fixed cost of $5,000 each month for rental of the building and this amount can be budgeted with certainty in the monthly operating statements. However, these two independent expenditures, which can be forecast with reasonable accuracy, when combined as unit costs for different volumes of production, varied from a manufacturing cost of $2 to $6 each. An interesting observation might be that *sales volume increased 400 per cent* while *manufacturing cost per unit decreased only 66 per cent.*

Fixed Budgets and Shifting Costs

It is this variability of costs at different production levels which limits the usefulness of the older type of budget, the fixed budget which cannot be ***automatically adjusted to actual volume,*** but, instead, represents a forecast fixed level from which the actual results are to be measured. A fixed or forecast budget necessarily provides for allowed expenses for one level of production whereas the actual production for the period may vary widely.

This situation is illustrated by Exhibit 2. The figures there shown for indirect labor variation are particularly open to com-

DEPARTMENTAL OPERATING STATEMENT
BUDGET—FIXED BASIS

	November			*December*		
	Budget	*Actual*	*Variation*	*Budget*	*Actual*	*Variation*
Direct labor	$60,000	$100,000		$100,000	$75,000	
Manufacturing Expense						
Indirect labor	$54,000	$ 80,000	($26,000)	$ 90,000	$ 71,250	$18,750
Mfg. supplies	3,000	5,000	(2,000)	5,000	4,500	500
Maintenance	5,000	10,000	(5,000)	8,330	7,500	830
Fixed charges	12,000	12,000		12,000	12,000	—
General	3,200	4,800	(1,600)	5,330	6,000	(670)
Total Indirect Expense	$77,200	$111,800	($34,600)	$120,660	$101,250	$19,410

EXHIBIT 2

ment. It will be noted that in the month of November indirect labor exceeded the budget by $26,000. However, the budget also shows indirect labor at ninety per cent of direct labor dollars, but actual indirect labor for the month was only eighty per cent of direct labor dollars, with a decrease in cost on this basis instead of the increase which the absolute figures of the fixed budget indicate. In the month of December, the dollar cost of indirect labor is under the budgeted amount by $18,750. However, the budget figure reminds that indirect labor is properly computed as ninety per cent of direct labor dollars, whereas actual December operations show indirect labor at ninety-five per cent of direct labor dollars. The apparent December saving is thus as misleading as the apparent November overage.

Flexible Budget Columnar Type—Department 10

Based on 1 Month's Operations

Acct. No.	Operating Level—Based on direct labor per cent of capacity / Name of Account	$50,000 50%	$55,000 55%	$60,000 60%	$65,000 65%	$70,000 70%	$75,000 75%	Allowed expense for each level of operating activity: $80,000 80%	$85,000 85%	$90,000 90%	$95,000 95%	$100,000 100%
01	Indirect labor	$100	$110	$120	$130	$140	$150	$160	$170	$180	$190	$200
02	Clerical	1,000	1,000	1,000	3,250	3,250	3,250	4,000	4,000	4,000	4,750	4,750
07	Group leaders	6,000	6,000	6,000	7,800	7,800	7,800	9,600	9,600	9,600	12,000	12,000
09	Reset.—Check.—Correct.	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—
10	Set-up	1,500	1,650	1,800	1,950	2,100	2,250	2,400	2,550	2,700	2,850	3,000
13	Methods	500	500	500	500	500	850	850	850	850	850	850
14	Lost time	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—
19	Rework operations	250	275	300	325	350	375	400	640	675	950	1,000
26	Teaching and learning	500	550	600	650	700	750	800	1,700	1,800	1,900	2,000
28	Supervision	1,250	1,250	1,250	1,600	1,600	1,600	2,000	2,000	2,000	2,000	2,000
29	Inspection	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000	9,500	10,000
35	Vacation allowance	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
36	Overtime premium	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	1,000	1,600	1,800
37	Night premium	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	—0—	300	350
89	Payroll taxes—Fed. and State	2,013	2,188	2,363	2,670	2,845	3,030	3,294	3,500	3,708	4,013	4,200
ST	Total Indirect	19,113	20,123	21,133	26,675	27,685	29,055	33,104	35,210	37,313	42,803	44,150
51	Gas and water											
52	Perishable tools											
53	Productive mat'ls.—Not on stds.											
54	Mat'l. and supplies											
66	Lubricants and cutting compounds											
ST	Total Supplies	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000	14,250	15,000
61	Mach. and equip.—Rep. and maint.											
63	Tool and die maintenance											
64	Plant rearrangement											
68	D. P. C. tool replacement											
ST	Total Maintenance	7,000	7,600	8,200	8,800	9,400	10,000	10,600	11,200	11,800	13,300	15,000
78	Rental—Mach. and equip.											
81	Build. serv. occupancy											
98	Depreciation—Mach. and equip.											
ST	Total Fixed Charges	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
84	Mfg. errors—Scrap											
ST	Total	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000
90	General											
94	Compensation insurance											
ST	Total General	2,013	2,188	2,363	2,670	2,845	3,030	3,294	3,500	3,678	3,956	4,134
GT	Total Indirect Expense	$65,126	$67,611	$70,096	$77,245	$79,730	$82,585	$88,198	$91,810	$95,391	$108,109	$113,284

Exhibit 3

A fixed budget is, therefore, of little value for the control of expenses at different levels of production volume. If we attempt to make it such by forecasting what *will* happen during the budget period so that each month's operations will show minimum deviation from the fixed plan, we will find ourselves establishing most of the figures and ratios which are used to maintain a satisfactory variable budget. We might as well have the advantage of current operating control for the daily, weekly, and monthly operating periods, which it affords.

Data Required for the Flexible Budget

The usual arrangement of the columnar type of flexible budget, illustrated in Exhibit 3, shows the amount of expense allowed for progressive rates of activity or levels of production in steps of 5 per cent from 50 per cent to 100 per cent of normal capacity. It is really a multiple projected (fixed) budget with standard allowances shown for different production volumes or rates of activity.

In the construction of this type of budget, consideration is always given to the fixed and variable elements of cost by the correlation of individual expenses to various levels of operating capacity. For example, duties of indirect employees are analyzed and provision is made for additional employees when production volume makes this necessary. The "Supervision" line on Exhibit 3 will indicate this concretely. Between 60 per cent and 65 per cent of capacity an additional assistant foreman becomes necessary increasing the allowance by $350 per month at the latter volume level. It can also be observed that the dollar cost of supervision remains constant at $1,600 per month until an operating level of 80 per cent is reached when it again becomes necessary to add an assistant foreman because of additional workers required for the increase in production. Thus, in the construction of the columnar-type budget, semivariable expenses are considered fixed within a certain range of activity for each type of expense.

In order to determine the allowed expenses, once these basic figures have been established, it is necessary to refer to the column which most nearly relates to the actual production volume. If the actual production volume, converted to standard dollars, were $60,000 per month, the sixty per cent operating level would apply. Interpolations can be made for any actual level of operations falling between operating levels for which figures are shown.

The variable rates developed for budgeting purposes will be the same rates as those used for the application of cost to product. To apply fixed costs to product, however, it is necessary to select a scheduled volume of production and use this volume factor as a base for the distribution of fixed expenses to the product.

Selecting the Unit of Activity Base

In selecting the unit of activity for measurement of variable costs or the variable element of semivariable ones for budgeting purposes, a base must be used from which a correlation can be made with actual results for the manufacturing expenses under consideration. This base should represent as closely as possible the effect of the type of expense on production output in units of product.

Where a basis is used which is not related to productive output, there is danger of a shifting of values between the base and the expenses to be budgeted, resulting in an unjustified allowance because of an inflated base which may contain excessive costs and is therefore not representative of productive output. An example of this might be the use of actual rather than standard direct labor (dollars or hours) as a base. As direct labor is subject to exceptional circumstances (really variances), its use as a base would result in inequitable expense allowances which could be smoothed out by use of standard direct labor as the base.

Semivariables: The Example of Indirect Labor

In referring to fixed and variable costs, I have made it seem, perhaps, as if these selections could be easily made from an ordinary operating report or financial statement. There is, of course, more work to it than a casual selection. Some items *can* be designated quickly as fixed or constant costs such as taxes, depreciation, and insurance. However, an examination of the supervision, maintenance, clerical, supplies, and group leaders categories readily discloses that they are neither wholly fixed nor wholly variable but contain both elements. It therefore becomes necessary to determine what part of these expenses in the composite are affected by volume of production and what part remains constant regardless of changes in production volume.

There are several different methods that can be used in making this analysis. A detailed examination can be made of the elements of each expense by the usual inventory or nose-counting method,

i.e. listing the number of indirect people required, such as assistant foremen and stock clerks. Personnel employed in each of these classifications are listed and a determination is made as to the level of capacity at which additional manpower is required and at what production ouput employees must be shifted or removed from their present jobs and transferred to other departments.

Another method, here illustrated, is the use of a chart for the correlation of expenses to standard direct labor, based initially on experience and then adjusted for other factors. In referring to Exhibit 4, it will be found that by the charting of indirect labor in relation to standard direct labor, a fixed cost of $1,200 and a variable rate of 31.8 cents for each dollar of direct labor has been developed. The vertical reference line in this chart shows indirect labor dollars for values ranging from zero to $6,000 per month and the horizontal reference line shows the standard direct labor dollar volume over a range which will cover the respective monthly volumes of the past year.

In January, indirect labor was $3,600 and direct labor $4,200 and is plotted as point (1). February shows an indirect labor cost of $3,800 and a direct labor cost of $6,300, the convergence being indicated by the point directly under (2) on the chart. Succeeding months were plotted in the same manner and the dispersion of the entire twelve formed a rough diagonal on the chart slanting upward from the months of low production to the months of higher production. However, two points, (1) and (11), were irregularly located and examination of the records showed unusual expenditures. These months were therefore eliminated and an average line, the solid diagonal on the chart, was drawn at sight through the middle position of the remaining months.

This median, or average, line showed that at zero volume of direct labor, there still remained $1,200 of expenses per month which were constant or fixed regardless of the volume of production. In referring to the chart, it will also be found that a total cost of $4,950 for indirect labor is shown for a production volume of $10,000 of standard direct labor. Subtracting the fixed cost of $1,200 from the total indirect labor cost of $4,950 at that volume, we arrived at a net variable cost of $3,750 for $10,000 of standard direct labor or 37.5 cents for each dollar. However, this was only the starting point for budget allowance determination. It was decided that, due to changes made in the department illustrated, in the way of better supervision, the variable expenses could be reduced

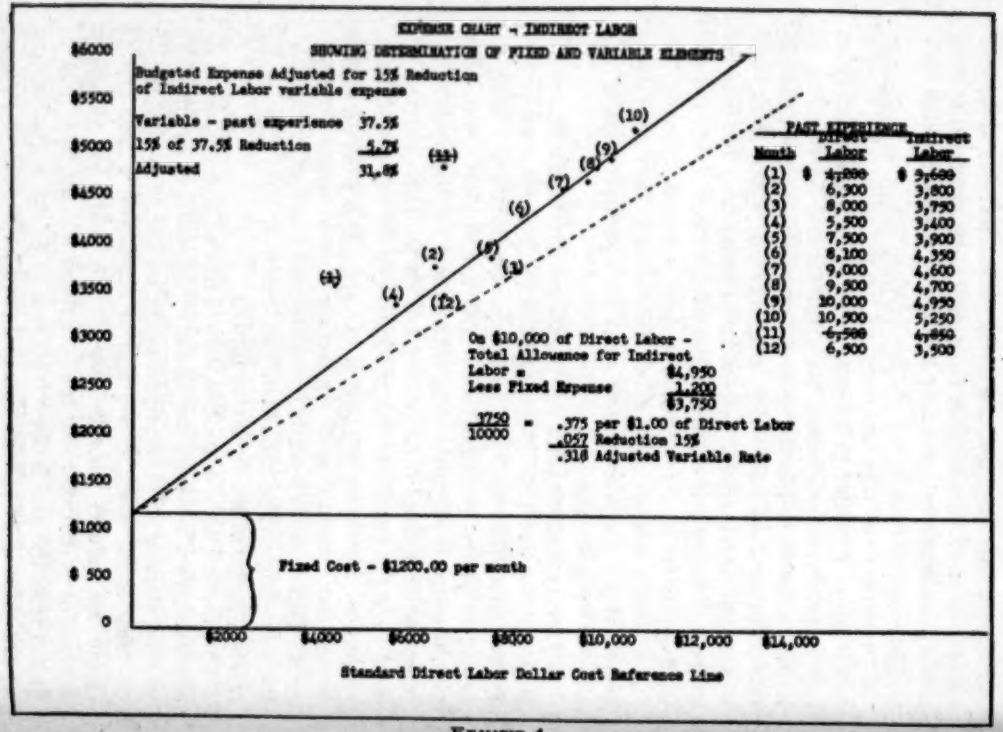
EXPENSE CHART - INDIRECT LABOR
SHOWING DETERMINATION OF FIXED AND VARIABLE ELEMENTS
Budgeted Expense Adjusted for 15% Reduction of Indirect Labor variable expense
Variable - past experience 37.5%
15% of 37.5% Reduction 5.7%
Adjusted 31.8%
$6000
$5500
$5000
$4500
$4000
$3500
$3000
$2500
$2000
$1500
$1000
$ 500
0
$2000
$4000
$6000
$8000
$10,000
$12,000
$14,000
Fixed Cost - $1200.00 per month
Standard Direct Labor Dollar Cost Reference Line
On $10,000 of Direct Labor -
Total Allowance for Indirect Labor = $4,950
Less Fixed Expense 1,200
$3,750
3750/10000 = .375 per $1.00 of Direct Labor
.057 Reduction 15%
.318 Adjusted Variable Rate
PAST EXPERIENCE
Month | Direct Labor | Indirect Labor
(1) $ 4,800 | $ 3,600
(2) 6,300 | 3,800
(3) 8,000 | 3,750
(4) 5,500 | 3,400
(5) 7,500 | 3,900
(6) 8,100 | 4,350
(7) 9,000 | 4,600
(8) 9,500 | 4,700
(9) 10,000 | 4,950
(10) 10,500 | 5,250
(11) 6,500 | 4,850
(12) 6,500 | 3,500

Exhibit 4

fifteen per cent or to a new expense allowance of 31.8 cents for each dollar of standard direct labor. The broken line on the chart shows this change. As fixed cost of $1,200 represents the salary of foremen, clerks, and methods engineers, it was decided that no reductions should be made at this time.

Therefore, *for any volume of production* we can budget total indirect labor cost as standard dollars representing production volume in terms of direct labor *times* the indirect variable labor rate of 31.8 cents, plus the fixed cost. Determination of variance by inspection may be illustrated by use of the plotted points for the two months not considered in establishing the trend line. During the month of January, when we had actual cost of $3,600 of indirect labor for $4,200 of standard direct labor, the plotted point (1) is above the adjusted (broken) line by $1,050. During the month of November, we had a similar situation, probably resulting from the failure to cut back indirect labor as rapidly as volume of production decreased. In this month, indirect labor cost exceeded the budget by $1,580, as indicated by point (11).

Budget Data for Foremen and Supervisors

In working with the foremen and supervisors—who are the people to be depended on to control expenses—a simplified form of working budget is used, easier to assimilate than the allowance table and chart heretofore described. This simplified form is set forth in Exhibits 5 and 6 and will show the foreman and supervisor the variable rate and the fixed allowance for the expenses for which

VARIABLE RATE AND FIXED ALLOWANCE FOR DETAIL OF INDIRECT LABOR
Department No. 26

Acct. No.	*Name of account*	*Allowed Expense*	
		Cost per $1 direct labor	*Fixed cost per month*
01	Indirect labor	1.0¢	.....
02	Clerical	3.0	$ 200.00
07	Group leaders	9.0	200.00
10	Setup	3.	.....
13	Methods	1.0	300.00
19	Rework operations	0.5	.....
26	Teaching and learning	0.8	.....
28	Supervision	1.5	500.00
29	Inspection	8.0	.....
35	Vacation allowance	2.0	.....
89	Payroll taxes	2.0	.....
		31.8¢	$1,200.00

EXHIBIT 5

VARIABLE RATE AND FIXED ALLOWANCE FOR EACH CLASS OF EXPENSE
Department No. 26

Manufacturing expense by major classes	*Allowed Expense*	
	Cost per $1 direct labor	*Fixed cost per month*
Indirect labor	31.8¢	$1,200.00
Manufacturing supplies	10.0	.....
Maintenance	12.0	1,000.00
Fixed charges	....	3,000.00
Manufacturing scrap	4.0	.....
General	2.0	50.00
Total manufacturing expense	59.8¢	$5,250.00

Average Direct Labor—Scheduled $7,600 per month.

EXHIBIT 6

he is responsible. Exhibit 5 takes the data for direct labor which has been charted and tabulates it by detail categories. Exhibit 6 shows the budgeted variable rate and fixed cost for the major classes of manufacturing expense. For most of these, charts and detail after the manner of Exhibits 4 and 5 will ordinarily be prepared. It is now relatively easy to calculate budgeted expense allowances for any given volume of production by multiplying the variable rate for each type of expense by standard direct labor dollars and adding the fixed dollar amount. For example, the variable expense allowance for group leaders of nine cents per standard direct labor dollar would give a variable allowance of $720 in addition to fixed costs of $200 for a total allowance of $920 on a production volume requiring direct labor at standard of $8,000.

It is possible to use a daily labor report which shows figures to the supervisor for his department on the following day. This report shows the actual direct labor hours, standard direct labor hours, percentage of operating efficiency, and the classification of indirect labor hours by types. In this way it is possible for the supervisor to control his direct and indirect labor hours on the basis of measuring production output in standard hours against actual hours of labor paid for. The foremen and supervisors will be particularly receptive to this variable type of budget which allows for an increase in cost when production volume increases and requires a decrease in cost when the volume of production moves downward.

Conference Procedure for Budget Allowances

Ordinarily departmental expense budgets are developed by the budget men in conference with the individual supervisors or fore-

men and department heads in the organization. While the average supervisor or foreman may not have the data or experience to develop a budget without help, his cooperation in the development of standard allowances should be encouraged. When this is done, management can also expect his cooperation in trying to meet budget requirements. In developing expense allowances for a department the first time, considerable preparation should precede the conference. Past data must be analyzed to determine the content of each expense account and its relationship to changes in the volume of production. This furnishes a starting point for the analysis and provides a good indication of whether items should be treated as fixed, variable, or semivariable expenses.

All the expenses of the department, item by item, should be reviewed by the budget man and the supervisor. The function of every indirect worker should be questioned under such heads as the following:

1. Can certain routines be eliminated, curtailed, or simplified?
2. Would greater care in the use of supplies result in economy?
3. What is the operating condition of the productive facilities and what maintenance will be required if operations continue as at present?

These questions and others like them give the budget man and supervisor an opportunity to decide to what extent the expense experience of past periods can be adjusted in setting up budget allowances. In making this intensive review with the supervisor, it is possible to determine the current rate of operation which provides a basis for projecting the dollar costs for different production levels. With the fixed expense allowance determined, the same amount is carried up to such other percentages of capacity operation as it may apply to and increased amounts are applied at appropriate higher capacity ranges. Where the expense is completely variable, the variable rates will be extended by the direct labor load representing the output for the respective production levels to determine the allowed expense.

The Break-Even Chart

Profits are the end result of various forces of selling price, sales volume, and fixed and variable costs. In forecasting profits and in planning the operations for the coming period, it is necessary to

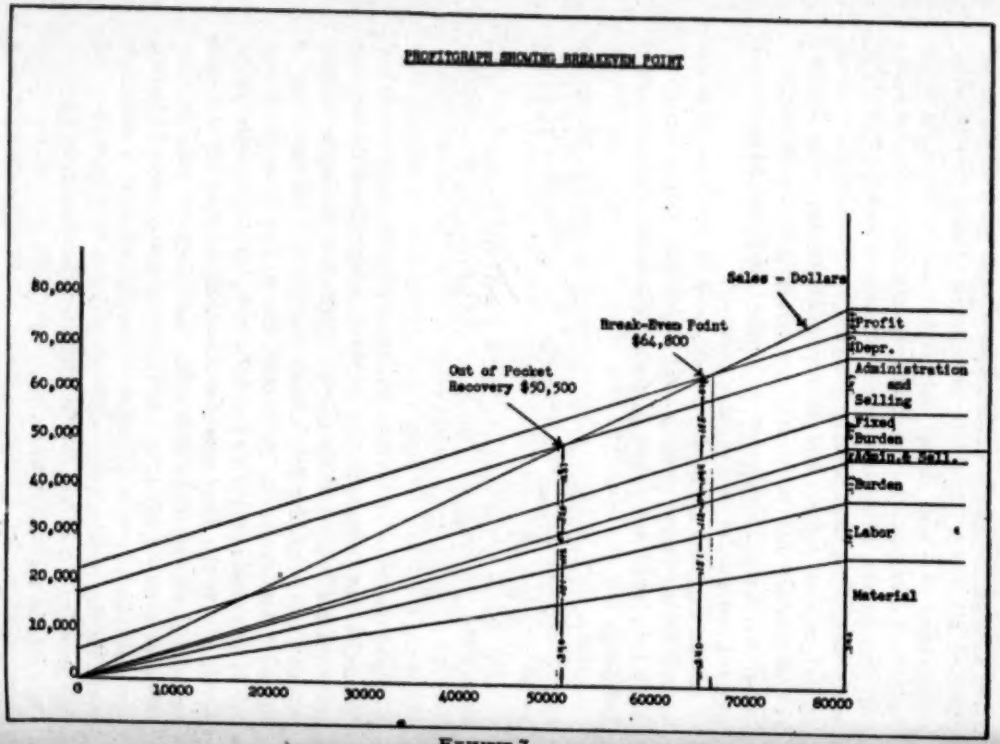
PROFITOGRAPH SHOWING BREAKEVEN POINT
Sales - Dollars
Break-Even Point
$64,800
Out of Pocket
Recovery $50,500
Profit
Depr.
Administration
and
Selling
Fixed
Burden
Admin. & Sell.
Burden
Labor
Material
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
0
10000
20000
30000
40000
50000
60000
70000
80000

EXHIBIT 7

bear in mind the contribution to the profit picture made by each of the above factors. The solution to a poor profit situation may not be an increase in selling price or even an increase in sales volume. The answer may be a decrease in costs or a change in the composition of the sales. Decreased costs definitely affect the location of the break-even point and thus a profit potential may be increased materially without any increase in the selling price or sales volume.

The break-even chart is a master budget and relates all elements of costs to sales dollar volume. It projects all conditions under which the business is now operating for all increases and decreases in volume and cost. It is possible, therefore, to know whether or not a seemingly healthy profit situation is on the verge of disappearing into a break-even or loss position. The break-even chart, or profitgraph, is made up by integrating all departmental operating budgets of fixed and variable expenses so that the combined activities of each supervisor or department head are reflected in the operating condition of the company as a whole.

An examination of the profitgraph, Exhibit 7, will show a comparatively high break-even point which is due largely to a high percentage of fixed cost on a sales volume of $80,000. If competition should make it impossible to increase selling prices, it is obvious from this chart that a reduction of fixed costs would be of the greatest benefit in lowering the break-even point in response to a lower sales volume. This might mean that the company could anticipate profits at closer to $50,000 in sales and, at the present break-even point, would therefore enjoy a profit about 100 per cent greater than currently.

It is interesting to note that as fixed costs are reduced, greater protection is obtained by the company in guarding against operating losses when sales volume is decreasing and, conversely, greater opportunities for profit when sales volume is on the increase. Another interesting observation is that a reduction in fixed costs, wherever possible, will result in greater benefits than reductions of the same amount in variable costs. For example, if variable costs were reduced $5,000, the resulting break-even point would be at $55,000. On the other hand, if fixed costs are reduced by $5,000 on a volume of $80,000, the break-even point will be lowered to a position of $50,500 per month and it will then be possible to obtain and realize a profit on all sales in excess of $50,500.

Tom Smith's "Business"

Perhaps the presentation is now complete from the accountant's viewpoint. We have derived the budget allowances, prepared a simplified statement of them by foremen and supervisors, and have merged (so to speak) all operating factors into a break-even chart which will be useful in steering a profitable course. However, there lacks still one important thing. Not only must management know the results of cost control efforts in each department, the supervisor must also know and be sensitive to results. These are the two reasons for the Monthly Statement of Expense (Exhibit 8). Perhaps the supervisor's angle is the more important one in some respects. A hypothetical narrative may get this across.

MONTHLY STATEMENT OF EXPENSE

March, 1947 Supervisor, T. Smith Dept. 26 Schedule 25 No.——

Acct. No.	Name of account	Current Month: Actual	Current Month: (Over) under budget	Year to Date: Actual	Year to Date: (Over) under budget
562-3	Direct labor efficiency..	$ 600	91.5%	$ 6,200	93.2%
144	Direct labor at standard	$ 6,500	$ (600)	$ 85,100	$(6,200)
144 D	Direct labor not on standards				
	Service labor				
T	Total direct labor...	$ 6,500	$ (600)	$ 85,100	$(6,200)
01	Indirect labor	$ 150	$ (85)	$ 800	$ 51
02	Clerical	488	(93)	4,700	53
07	Group leaders	1,340	(555)	12,800	(2,941)
09	Reset.—check.—correct.	120	(120)	300	(300)
10	Setup	150	45	2,700	(147)
13	Methods	370	(5)	4,200	(49)
14	Lost time	212	(212)	400	(400)
19	Rework operations	63	(30)	450	(25)
26	Teaching and learning..	50	2	753	(72)
28	Supervision	740	(142)	7,400	(623)
29	Inspection	887	(367)	8,800	(1,992)
35	Vacation allowance	130	...	1,702	.....
36	Overtime premium	...	...	280	(280)
37	Night premium	...	...	65	(65)
89	Payroll taxes—Federal and State	150	(20)	1,800	(98)
ST	Total indirect labor.	4,850	(1,582)	47,150	(6,888)

(Form continues with similar spread for remaining expense captions shown in Exhibit 3)

EXHIBIT 8

The other day I was discussing this report with Tom Smith, supervisor of Department No. 26, when he suddenly popped the question, "Why should I be interested in controlling my expenses if I am meeting production schedules?" It is true that Tom was meeting production schedules, but, on the other hand, if all departments operated at the cost at which Tom operated his department, the company would not be making a profit on its product, to say nothing about staying in business. Tom is a good mechanic but has not been particularly interested in the costs of his department. Although he is aware that some of the other supervisors have done a much better job in the control of costs than he has, he is one of those fellows who seems to think that the supervisor should not be bothered with costs.

So we decided to iron the matter out. We put it on the basis that Tom's department might be considered his own plant in which he had taken a contract to produce 500 units a month. We took applicable unit costs and pointed out that these would be (say): material $50, direct labor $100, and manufacturing burden $300, or a total estimated manufacturing cost of $450 each for a production of 500 units a month. Taking commercial expenses out of the selling price of the item in our line, we also pointed out that the remainder allowed at this cost a markup for profit of 12 per cent, or $54, i.e. a selling price of $504.

Our next step went right home to Tom's monthly expense statement, as exemplified in Exhibit 8, showing a departmental operating efficiency of 91.5 per cent which meant that direct labor cost per unit was no longer $100 but $111. We then referred to the statement again and found that Tom had spent $4,850 for indirect labor instead of $3,268, an increase of some 48 per cent. Manufacturing burden on product therefore becomes $444 rather than $300. The total manufacturing costs had in this way jumped to $605. With a selling price of only $504, Tom could see that his "business" was no longer profitable. However, he did have a solution. Why not add the $101 or more to the selling price and recover the extra cost? But of course competition dictates selling prices. If the price were boosted, the customer would very likely buy elsewhere.

Tom decided that it would be unprofitable for him to go into business unless he could be assured of controlling his own manufacturing costs and unprofitable for the company to stay in business unless it could obtain effective departmental control of costs. A review of the Monthly Statement of Expense for Department

26, will show heavy unfavorable variances for Tom to get to work on right away. However, he is not at a disadvantage. His budget allowances, developed in the ways described earlier in this paper, are arrived at in the same manner as the allowances for other supervisors. In fact, he can have as much of a hand as he wishes in setting them, for the amount of counsel we will listen to is limited only by the amount he is willing to give. As stated before, the derivation of budget allowances is a result of conference procedures.

Conclusion

Flexible budgeting has been given much favorable comment and exposition in this article. However, the success of cost reduction will not depend *entirely* upon the type of system or method that is used, whether it is the flexible budget, set up with a chart and accompanied by a dollar budget variation report and daily labor control report, or whether a fixed type of budget is used. Cost reduction in any organization is a big job and it will depend upon the cooperation of the management in "taking the bull by the horns." The finest budgetary control system is of little value in the control of operating expenses unless the supervisors and department heads are impelled to take such action as may be necessary to remedy the condition or cause responsible for the excess costs.

COMING ARTICLES

In the *N. A. C. A. Bulletin*, October 15, 1948

An Embryo Standard Cost System for Small Manufacturing Companies

by Seattle Chapter Committee to Promote Cost Accounting

Organizing the Business Report

by W. W. Neikirk

Speeding Up Monthly Closings and Reports to Management —It Can Be Done

by Raymond R. Wesley

YARDSTICKS FOR MOTION PICTURE THEATER REVENUES AND COSTS

by RAY A. HOWARD, Jr.,
Certified Public Accountant,
Peoria, Ill.

IN recent years, there has been an increasing realization of the importance of budgets and standards for measurement of overall and detailed operating results in many industries and companies, as manifested by the increasing volume of written and oral discussions of related topics. However, the motion picture theater, whose specialized problems place it in a somewhat distinctive category among businesses, appears decidedly to have been slighted. Therefore, it would seem that a treatment of the techniques of measurement that may be applied to motion picture theater operations might not be superfluous in the crowded and expanding field of current articles.

In any approach to measurement, at least two preliminary questions must be answered: (1) *Why* should the measurement be undertaken? (2) *What* should be measured? The answer to the first question requires little attention here, since it is common to all kinds of business and budgets. What gives basic importance to most budgets and motivates most budgeteers is the chain of reactions which starts with the necessity for management to make sound decisions, and the realization that these must be based upon sound judgments which in turn must be based upon sound measurements of facts.

Sources of Income and Chief Cost Categories

The second question deserves more attention in this case, since the motion picture theater displays some differences from many other businesses. The operations of a motion picture theater consist of the production and sale to the general public of intangible economic goods in the form of entertainment. The income from sales is termed admissions. As a means of securing or, at least, stimulating admissions, the theater makes use of various forms of advertising and publicity, referred to herein as promotion. In order to produce the entertainment, the theater buys the rights to exhibit various films for specified periods of time, furnishes a building and suitable equipment, supplies a staff of properly trained employees, and "pays the piper" for the regular line of general and

administrative expenses. As a sideline to the operations already mentioned, it is becoming widely practiced to operate within the premises sundry concessions for the sale of popcorn, candy, etc.

A typical operating statement for a theater would show, in general, the following categories of items—and all require measurement:

Income:	*Expenses:*
Admissions	Promotion
Concessions (screen advertising, etc.)	Film rental
Other	General and administrative expenses, including payroll, rentals (or maintenance and depreciation), utilities, supplies, etc.

Flexible Budgeting: Attendance as the Activity Base

Now that the approach has been made and the ball is resting on the green, the big question is *how* to get it in the cup. The general scheme for accomplishing this objective involves the preparation of a flexible budget which may be visualized in its entirety by a glance at Exhibit 1. The preparation of such a budget re-

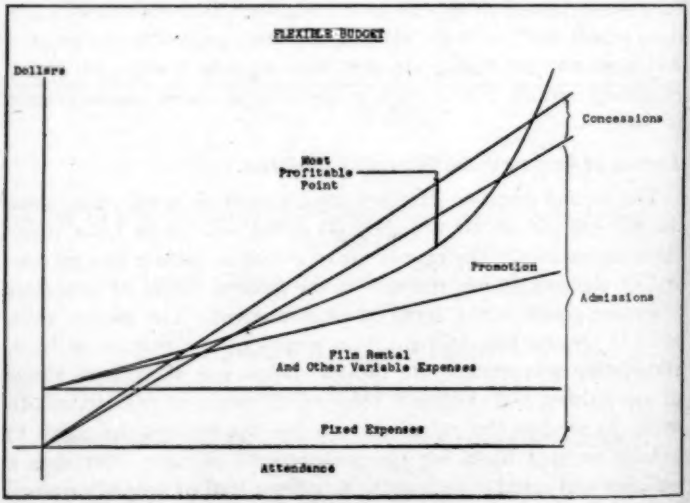

EXHIBIT 1

quires: (1) a consideration of the fundamental nature of and relationship between the various items to be measured and (2) the measurement of such items at various levels of activity. Before proceeding to particulars, it is interesting to note that the basis of the budget portrayed in Exhibit 1 is attendance, which has been selected as the activity base because of its close relationship to all items involved in the construction of the budget.

Admission and Concession Income

Since admissions are computed by multiplying prices and attendance and since prices are competitively matched and relatively stable, it is not difficult to measure the admissions at various levels of attendance. However, there are several considerations involved. These include:

1. Particular days of the week covered, since prices are usually different on weekdays than on Sundays and holidays.
2. Split between matinee and evening attendance, which can usually be determined with satisfactory reliability from sundry analyses of past experience.
3. Split in attendance between adults and children, since the prices again vary. This split will be based largely upon the type of attraction being shown and the market sought and should be determined in accordance with the subsequent discussion of promotion.

Income from concessions is plotted net of costs on the flexible budget chart as an addition to revenue from admissions. Since it is customary practice to charge concession operations with all applicable direct costs and expenses, the measurement of income from this source must consider gross income from concession sales, costs of goods sold, and overhead expenses. It might well be expected that the gross income from concession sales would vary directly with attendance, since the attendance determines the number of potential customers that are brought within the reach of the concessions stand. Such a relationship can be pretty completely substantiated by the preparation of a scatter chart. If the chart is carried to the point of grouping the data and computing a coefficient of correlation, a very high degree of correlation will be found, usually 90 per cent or better. Hence, the budgeting of concessions sales at various levels of attendance offers little trouble.

Concessions sales may be divided into two classes, differing as to determination of cost of goods sold, i.e., goods requiring preparation, such as popcorn, and goods purchased in saleable form, such as packaged candy. Cost at various sales volumes of goods requiring preparation can be obtained rather reliably from compilations of statistics concerning past experience in yields of materials and supplies. These must be reflected at current price levels, determinable from established markets in most cases. For concession merchandise purchased in saleable form, gross profit percentages, likewise based on experience, should be sufficiently stable to provide close budgeting related to the sales volume expected as based on attendance. Overhead expenses applicable to concessions are predominantly fixed and should be considered a constant deduction from concession sales at all volumes. In short the concession income line on Exhibit 1 represents a profit line taken from a separate but fairly simple flexible budget.

Cost Behaviour: Promotion

A glance at Exhibit 1 will show the part played by promotion expense, which is there displayed as an overriding expense above fixed and variable components of cost. In point of fact, promotion has no fixed element. Attendance—sometimes substantial—can be obtained without it. Perhaps this is because the mere existence of a theater in operation has a promotional effect related to its location. Neither is promotion expense variable in anything resembling a straight line. As promotion outlay is increased, attendance increases rapidly at first but more slowly as more promotion is applied, until finally the application of additional amounts of promotion will produce little or no change in attendance. There is a common-sense basis to this. There are some persons who need no persuasion but simply need to be informed that a certain attraction is available. Beyond this there are progressive strata of other persons who require continually more persuasion in order to be obtained as patrons until, finally, there are still other persons who could not, by any amount of persuasion be drawn to see the attraction in question, or perhaps any other. In other words, promotion expense shows markedly diminishing returns. It is responsible for the concave course of the total cost line in Exhibit 1 and presence of an optimum attendance level (less than theater capacity) beyond which promotion can bring admissions only by throwing operations toward or into a loss.

As a practical matter, it is quite difficult to determine and apply a satisfactory measure of the relationship between promotion and attendance. The conditions are extremely volatile and it is necessary to consider the following factors:

1. *Competition.* If there is competition, the potential patron has a choice and more persuasion may be required to convince him that he should make a particular choice.
2. *Prosperity of the community.* If the community business conditions are relatively good, it will take less persuasion to get the potential patron to decide to spend his time and his money on entertainment than if conditions are poor or actually bad, and vice versa.
3. *Program of attractions.* This is a highly fluctuating thing and may be the most important single factor, since (such is the variety of tastes and types of audiences) the entire potential market changes with each change in program. There are two considerations here. One is the type of attraction—western, mystery, musical, etc.—which determines the qualitative characteristics of the potential market and thereby determines the outside size of the market. The other is the intrinsic value of the attraction (the calibre of the story, production, and stars), which determines the strength of appeal within the market.
4. *Certain other factors such as weather, institutional reputation of the theater, etc.* Although these factors have some effect, they are either minor, relatively stable, or cannot be anticipated.

From the above discussion, it is obvious that one measurement cannot be sought to serve all conditions and none can be exact. The measurement of promotion as related to attendance, must be changed sharply for each change of attractions and competition, and also gradually for changes in business conditions. With this actuality in mind, an assortment of measures must be prepared to cope with a variety of circumstances. The first step is to make a classification between types of attractions and the cost of reaching the potential market for each type. This involves:

1. A determination of the characteristics of the market for each type of attraction and the specific media which will best reach each market.

2. A compilation and tabulation of the costs of using these media to cover the market with varying degrees of intensity.

The second step is to make a classification by intrinsic values of the attractions within each type and a measurement of the intensity of promotion required to obtain various portions of the market as customers. In carrying out this latter measurement, it would also be well to consider, at the same time, the other factors of competition and prosperity of the community.

Although the methods just described depend heavily upon market research for their effectiveness and although there is little data from past experience that can be relied upon, they provide a plan for the collection of suitable data as future operations progress, until eventually appropriate budgets can be constructed for promotion expense in relation to attendance.

Film Rental and Other Costs

Film rental arrangements consist of three basic types, as shown in Exhibit 2, or variations of these types: (1) flat, which represents a fixed amount for the engagement, (2) percentage, which is a fixed percentage of admissions, and (3) sliding scale, under which the rental is determined as a percentage of admissions and

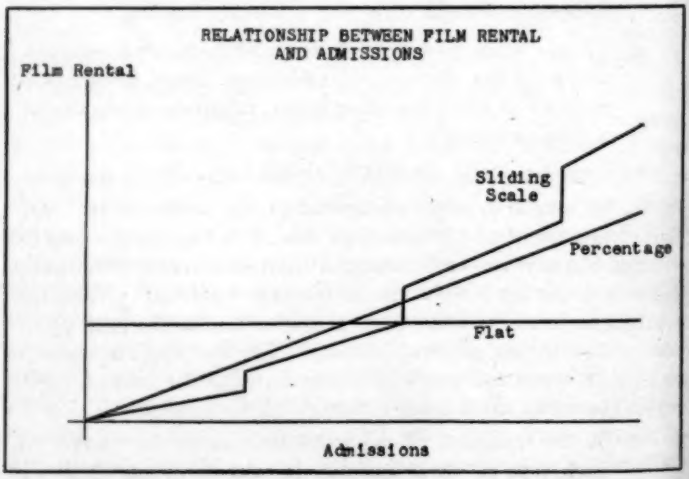

EXHIBIT 2

the percentage increases in graduated jumps as the total admissions increase. Since the rental arrangements are usually consummated well in advance of the showing of the attraction and since the rental is either fixed or variable in direct proportion, or with a known relationship to admissions, there is little difficulty in preparing a flexible budget of the film rental based on attendance.

In considering the budgeting of all other expenses, the first consideration is to segregate any fixed and variable elements that may be present in the expenses. This can be effectively done by the combined use of rational analysis of the contents and nature of the expenses and by scatter charts. In most cases, the variable portions may be expected to be minor so far as practical considerations are concerned.

Close Scrutiny of the Fixed Element in Expenses

The second and most important aspect of budgeting other expenses is the development of a technique of analyzing, planning, and measuring fixed expenses. The general procedure recommended for this purpose is as follows:

1. Analyze each expense into all possible components, according to types and purposes.
2. Study the objective for each type of expense and attempt to set out more efficient methods of accomplishing the purpose.
3. Attempt to express the components of the expense in terms of quantities based on past experience, improved by a scientific study of methods, and reflect these quantities at current unit costs.
4. Compile the final budgeted amount.

Since the above procedure would differ in detail for each expense—with the types of expenses actually encountered varying with the circumstances of individual theaters, and since the techniques involved are similar to the general budgeting procedures applicable to many businesses, it would be less feasible and probably less helpful to present a discussion of the technique of budgeting each of the items of expense than of the major items of promotion and film rental covered earlier in the paper. Suffice it to say that in the aggregate, these remaining expenses are important for their large fixed component and the desirability of reducing this wherever practicable.

Use of the Yardstick: Efficiency

After the proper steps have been taken to construct the flexible budget in the form for which Exhibit 1 serves as an outline, it can be used to measure:

1. The efficiency of operations (i.e., the ability to maximize income and minimize expense); and
2. The profitability of operations (i.e., the adequacy of profit returns).

In applying the flexible budget to these purposes, another and perhaps the most important characteristic that distinguishes the motion picture theater from many other businesses enters the scene. Theater operations are simultaneously dynamic and rigid. The goods sold by the motion picture theater have the perishability of fresh vegetables and the variety of a department store and yet, at the same time, the theater is subject to many conditions and circumstances which change only slowly. Therefore, the yardstick which the budget constitutes must be *applied* for the short term (i.e., weekly or with each change of attraction) or the long term (i.e., quarterly, semiannually, or annually), depending upon the nature of the items concerned.

The efficiency of performance with respect to the variable items must be measured for the short term, since these items are markedly affected by the dynamic nature of the business. The yardstick for performing this measurement of actual results must be specifically selected at the point in the budget representing the most profitable arrangement of all variable items. This point of most profitable arrangement occurs where the total expense and total income are vertically the farthest apart, as shown in Exhibit 1. It may be further noted that the most profitable point occurs where the slope of the tangent to the income curve is exactly equal to the slope of the total income curve. Hence the fixed expenses, with a slope of zero, do not influence the selection of this point.

The efficiency of performance with respect to the fixed items must be measured for the long term, since these items are not affected by the dynamic nature of the business but are subject to the rigidity characteristic. Since the budget for those fixed items is the same at all points, the selection of the yardstick for measuring actual results is not unique.

Use of the Yardstick: Profitability

As distinguished from the measurement of efficiency, which is always a budgetary problem, the measurement of profitability for the long term has never been primarily a budgetary problem, since it is perhaps adequately reflected in statements of actual operations. However, the measurement of profitability of the short term—to make sure that efficiency and other factors are reflected in profit within periods—requires an allocation of the budgeted fixed expenses, since these expenses are in the nature of overhead and must be absorbed by total admissions, just as factory overhead must be absorbed by total production. Such an allocation may be arrived at somewhat as follows:

1. On the basis of past experience and anticipated future conditions, estimate total admissions for the long term, which will include a representative variety of attractions of all types and intrinsic values.
2. Divide the long-term budget for overhead expenses by the total estimated admissions figure and obtain a rate that may be applied to the specific admissions figure for the short term.
3. At the end of the period, analyze the variation between actual overhead expenses and the amount applied to operations, by attributing the appropriate portions to budgetary over or under spending and to over or under adequacy of total actual admissions for the period to absorb the overhead at the rate previously determined. This analysis, of course, corresponds to a similar one commonly made for factory overhead.

Conclusion

In conclusion, it would seem the part of wisdom to examine the budgeting procedures in use for motion picture theaters, to admit strengths and weaknesses in the suggestions here made, and to look above and beyond as to what might be done in the future. From the author's experience theatremen, and even the accountants that track and trail them, have been notably disinclined, especially in smaller operations, to go to any lengths in the application of quantitative measures to their volatile and explosive plights and successes. It is felt by the author that the suggestions contained in this article present, if nothing more, a concrete and workable starting point to the situation.

N.A.C.A. BULLETIN

Section Three

RESEARCH SERIES NO. 14

STANDARD MANUFACTURING COSTS FOR PRICING AND BUDGETING

VOL. XXX, NO. 3 OCTOBER 1, 1948

FOREWORD

This report continues the series covering uses of standard costs. Dealing with standard costs for pricing and budgeting, it again shows how standard costs can provide management with the types of costs needed for various purposes. Practice in the use of standard costs described in this report is drawn from the same field study covering 72 companies upon which earlier reports in the series have been used. A final report in the form of a case study showing how the various uses of standard costs are co-ordinated by a specific company will conclude the series.

I. WAYNE KELLER, *Chairman,*
Committee on Research.

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STANDARD MANUFACTURING COSTS FOR PRICING AND BUDGETING

PREVIOUSLY published studies in this series have dealt with standard costs for cost control and for costing inventories. There remains to be considered the use of standard costs in pricing and budgeting. Costs for these purposes must be predetermined costs since decisions in the fields of pricing and budgetary planning are made before the costs under consideration are incurred. They also need to be flexible enough to meet new conditions that arise and reliable enough to serve as dependable guides to management. Standard costs are especially valuable for these purposes to the extent that they are predetermined costs based upon a careful study of what can be accomplished with the production facilities available. Such standards are also readily adjusted to reflect anticipated changes in prices of material and labor, production methods, or volume.

Standard Manufacturing Costs for Pricing

Pricing is essentially a management problem rather than an accounting problem. In order to set selling prices, executives who make pricing decisions need information about the relevant factors, one of which is costs to make the goods to be sold. Furnishing these costs is regarded as an important function of the accounting department in most of the companies whose practices were used as the basis for this series of studies on standard costs. This study is concerned with the kinds of costs which are furnished to management for price making purposes. It will not consider the question of how selling prices are actually set.

Replies as to the kind of costs supplied for pricing were received from 67 of the 72 companies. Of these, 62 companies make use of standard costs in pricing.[1] A number of companies commented to the effect that the use of standard costs saves clerical work in preparing cost information for pricing purposes and

[1] The remaining 5 companies make no use of standard costs in connection with pricing. At the time the field survey was made, one of these companies had standard costs which had not been revised since before the war and use of standard costs had been largely discontinued until such time as they could be brought up to date. The other four companies stated that cost is not a consideration in pricing their products. However, one of these companies does use its standard costs to estimate gross profit by product lines as a check upon its pricing.

makes costs available to pricing executives more quickly than would be possible if standard costs were not available. As stated by one writer:

> "Since standard costs represent the cost that should be attained in a well-organized plant operated at normal capacity, they are ideally suited for furnishing information as to costs of manufacture which will enable the sales department to properly price its products to the trade.
>
> "The use of standards eliminates the necessity for innumerable factory tests, which are otherwise required to provide the basic data for the building of cost estimates for the sales department. Cost estimates based upon factory tests or past averages are bound to vary more or less and may in no instance represent the cost that should be attained under normal operating conditions."[2]

Responsibility for Pricing

Costs are supplied to the department or persons responsible for pricing decisions. Location of this price-making authority varies according to the organization plan of the individual company. However, the sales department or some executive in the sales department was mentioned by most companies as receiving the cost information prepared for pricing purposes. Hence it appears that in most of the companies the sales department is in possession of information concerning the standard costs of manufacturing the goods sold. In a number of these companies cost prepared for pricing purposes are also supplied to various top executives not concerned exclusively with sales. Thus the president, vice presidents, treasurer, and controller were frequently mentioned.

Some companies reported that pricing was done outside the sales department and that the price data is supplied to the persons who determine prices. Thus two companies have a "price making" department, one company has a pricing committee, and in several other companies various executives set the prices.

Nature of Product and Method of Selling

The preparation of costs for pricing is influenced by the nature of the product sold and the methods of selling it. Companies

[2] E. A. Green, "Practical Standards—Their Development and Use," *N. A. C. A. Bulletin*, Feb. 1, 1935, p. 652.

selling standard products manufactured for stock usually publish their prices and therefore need costs for pricing only when new catalogs or discount schedules are being prepared.[3] Since catalog prices usually remain unchanged for a period and repeated sales are made at the same price, costs used in setting catalog prices must be representative of what the company can do on a continuing basis during the life of the price schedule. On the other hand, companies which sell special products manufactured to the customer's specifications need an estimate of cost each time they prepare a quotation. In this case every order raises a pricing problem and the cost department will be continually engaged in estimating costs for pricing purposes. Owing to these differences in the problems, the following discussion will be broken down into two sections covering, respectively, the use of standard costs for setting catalog prices and the use of standard costs for bid prices on individual orders.

In the group of 62 companies using standard costs in pricing, 51 have catalog prices and 41 have bid prices on special orders. Both catalog prices and bid prices were reported by 30 companies and hence these companies are represented in both categories. On the other hand, 21 companies have only catalog prices and 11 companies have only bid prices.

Standard Costs for Catalog Prices

Companies which have catalog prices can be divided into four groups in respect to the type of cost figures which they supply to pricing executives. These groups are composed of:

1. Companies which supply pricing executives with standard costs without application of any adjustments to the standards.
2. Companies in which costs supplied to the pricing executives are standard costs adjusted by the ratio of actual cost to standard cost as shown by the variance accounts.
3. Companies which use current market prices for materials, and in a few cases for labor, together with standard costs for other elements of product cost when preparing pricing costs.

[3] However, in several cases comments were received to the effect that current variances are watched as an indication of possible need for price revisions. This applies particularly to raw material prices and to labor rates.

4. Companies which adjust their standard costs to reflect actual costs which are anticipated during the period for which the prices are to be in effect.

It will be seen in the discussion below that these different procedures are often merely different ways of arriving at approximately the same concept of cost for pricing purposes.

Unadjusted Standard Costs for Pricing

Out of 51 companies which have catalog prices for some or all products, 13 stated that the standard costs which they supply for pricing are the same standard costs used for cost control and inventory costing purposes. No adjustments to cost standards used for pricing are made for variance account balances or for current market prices. However, the standard costs used by these companies are current in every case, the standards being reviewed and, if necessary, revised once a year or even oftener.[4] Thus the practice of these companies appears to be to bring the standard costs up to date each time new catalog prices are prepared.

Standard Costs Adjusted for Variances

It was found that 21 of the 51 companies having catalog prices adjust their standard costs by the ratio of actual cost to standard cost in preparing costs for pricing purposes. This point of view has been expressed in the accounting manual of one company as follows:

> "It is necessary, in order to operate at a profit, to establish our sales prices sufficiently high to cover those variances which we are unable to eliminate."

With a few exceptions, these companies have material price and labor rate standards which are not revised frequently enough to be close to current actual costs. A majority of the companies

[4] It may be interesting to note that one company in this group has two sets of standard costs, one of which is used for the purposes of pricing and cost control and the other used for inventory costing. The material and labor standards used for cost control and pricing are kept continuously up to date by making changes at any time necessary. Standard costs of material and labor used for inventory costing are revised only once a year. The standard overhead rates which are used both for pricing and inventory costing purposes were set 12 years ago and have not been changed since.

in this group revise their standard costs annually, but some revise irregularly. Thus several companies were found to be using standard costs set from 3 to 10 years ago, and these standard costs deviated very substantially from actual costs at the time the field study was made. Material usage and labor performance standards are, in some cases, kept tight relative to actual performance and hence these companies find that sizeable net debit balances are likely to appear in the variance accounts.

Companies adjusting standard costs for variances often have standard costs which are developed primarily for inventory costing purposes. In order to avoid the clerical expense entailed by frequent changes, the standard costs are revised only once a year.[5] Changes in costs which take place during the year show up on the books as variances and through adjustment of costing standards by the variance ratio, approximate current costs are obtained for pricing purposes. When costs for pricing purposes are prepared by this method it may be necessary to develop variances by products or types of products since an over-all variance ratio may not be appropriate for different products.

Standard Material Costs Adjusted to Current Market Prices

Five out of the 51 companies having catalog prices adjust material price standards to current market prices when using costs for pricing purposes. All of these companies produce products in which such raw materials as cotton, copper, or steel make up a large portion of the total cost. In these industries selling prices tend to follow raw material prices quite closely. Hence costs used for pricing are composed of current market price of the raw material plus standard labor and overhead needed to convert the raw material into a finished product.

Standard Costs Adjusted for Anticipated Changes

In the group of 51 companies having catalog prices, 12 companies adjust standard costs to reflect anticipated changes in costs. Here the aim is to price on the basis of future costs rather than upon past or present costs. As expressed by a writer on the subject:

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[5] For a discussion of methods employed for adjusting inventories when costing standards are revised, see "Standard Costs for Costing Inventories," Research Series No. 13, *N. A. C. A. Bulletin*, June 1, 1948, p. 1258.

"The catalog on which the sales department is working is the new season's catalog—not the old one. The price-fixing authority wants to know what products *will* cost not what they *did* cost. . . .

"Now let us see how standard costs meet this problem. Let us assume that our standard costs were set nine or ten months before and in the interim there have been changes in raw material prices and labor rates. Obviously these standard costs cannot be used for future price fixing. But observe that in order to figure these standard costs we had to make certain preparations. We had to determine the exact specifications of each product and compute the normal requirements of each constituent material, on the basis of normal yields, or wastage, and we had to establish normal time allowances for each operation. All of these were set down on a standard cost card or sheet. These quantity figures were extended at the normal prices or cost rates prevailing at the time the new year's standard costs were established. They are *now* available for pricing at *today's* prices and rates, or at the forecast normal prices and rates for *any* projected future period.

". . . Even though a change in normal production level may be forecast, the fixed and variable parts of the costs have been identified so that new normal rates may be computed without additional research."[6]

The standard costs used by these 12 companies vary from standards which are virtually current actual costs to standards which were obviously not current at the time of the interview. Adjustment of standard costs to reflect expected material prices and labor rates is made by all 12 companies. A few of these companies also make adjustments for efficiency expected and in some cases forecasted actual overhead is used in costs prepared for pricing.

Standard Costs for Bid Prices on Individual Orders

Products priced on a bid basis may be standard items, but perhaps more often they differ in some respects from products made before. In some instances they are entirely new. However, there are usually parts, materials, or operations which are the same as those used in products previously made. The existing standards are thus usually applicable in estimating costs of special or new

[6] George D. McCaffrey, "The Swing to Standard Costs," *The Arthur Andersen Chronicle*, July 1947, pp. 164-65.

products, although there may be a greater margin of error in such estimates than there is in cost estimates for products concerning which more experience is available.

When preparing bid prices, it might be expected that pricing executives would need more detailed information about the components of cost and how these components vary than when setting catalog prices on standard articles. This expectation is borne out by the results of the field study which indicate that most of the 41 companies pricing on a bid basis build up cost on each order or request for price from the detailed standards.[7]

Standard costs are usually used without adjustment when standards are current and variances are small in comparison with the margin of gross profit. However, about half of these 41 companies adjust the cost developed from the detailed standards to approximate actual in the process of compiling costs for bidding. Whether or not this adjustment is made seems to be determined partly by the type of standard cost in use and partly by the policy followed with respect to the kind of costs wanted for price making purposes.

Companies using standards which are infrequently revised adjust standard costs to approximate current actual levels for pricing purposes. This is usually done by applying the appropriate current variance ratio to the standard cost of the product, although material price standards are adjusted to current market levels by several companies. While definite information was not obtained, it appears likely that companies which maintain quite tight standards for purposes of cost control also adjust these costs by throwing back some or all variances when preparing cost estimates for pricing.

Companies which adjust standard costs to approximate actual costs for pricing purposes sometimes make an exception for the

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[7] The extent to which standards are so used by these 41 companies is tabulated below:

	No. of Companies
Use quantity standards to estimate material and labor requirements of order	39
Use material price and labor rate standards to estimate cost of material and labor of order	36
Use standard overhead rate to estimate overhead cost of order	37

In each case, the remaining companies out of the 41 reporting do not use standards for these purposes.

overhead element. In these cases the standard overhead rate is used without adjustment while variance ratios are applied to material and labor standards. Only 7 companies stated that they make any separation between fixed and variable portions of the costs used for pricing purposes. It thus appears that the marginal income approach to pricing is little used by the companies interviewed, for the separation of fixed and variable costs needed for this type of cost analysis is provided by only a few companies.

Effect of Order Size

An additional adjustment to standard costs used as a basis for special order price quotations is made to incorporate in pricing costs any effects which the size of the order is expected to have on manufacturing costs of the order. Such an adjustment is made by approximately two thirds of the companies reporting pricing on a bid basis.[8]

This adjustment is usually determined by the specific circumstances that cause costs to vary with order size. For example, where machine setup, tooling, or engineering costs differ from the allowances made for these items in the standard costs, the standard costs are adjusted to reflect the expected actual cost of the order.[9]

Comparison of Actual and Estimated Costs

Approximately two thirds of the reporting companies make comparisons between estimated costs used for pricing and actual costs of manufacturing goods for special orders. In some cases these comparisons are made only occasionally or on large orders. Apparently most of these companies rely upon their manufacturing cost variance reports for control of costs and compare costs estimated for pricing with actual costs principally to check upon the accuracy of their estimating procedure. Other companies com-

[8] Several companies which report no adjustment to standard costs for order size adjust the markup percentage instead of the standard cost.

[9] A manufacturer of sheet metal stampings separates its overhead costs into two groups and has two overhead rates. One of these, used to apply general plant overhead, is used without adjustment in preparing costs for pricing. The other rate is used to apply overhead which is special to the product on order and covers amortization of product development costs, setup costs, costs of special tools and dies, and other costs associated directly with specific orders. These latter expenses are applied at a rate based upon either the estimated quantity of a product to be sold or upon the number of units ordered by a customer.

pare estimates with actual costs on every order. In some instances the estimate of cost prepared for pricing becomes the control standard for the order and variances are developed on a job order basis.

Summary Regarding Standard Costs for Pricing

This study shows that when standard manufacturing costs are available, these standard costs are generally utilized for pricing purposes. Where standards represent performance which the company expects to attain and prices which it expects to pay for material, labor, and services, standard costs are used for pricing without adjustment. On the other hand, where anticipated changes in costs are not already incorporated in the standard costs or where standards do not cover all the costs which the company expects to have to incur to produce the goods, standards are adjusted accordingly. While variances are separated from standard costs for cost control purposes and, by many companies, excluded from inventories in accounting, an average provision for unavoidable variances is commonly included in costs used for pricing purposes.

Standard Manufacturing Costs for Budgeting

Budgets are used for planning and coordinating future activities and for controlling current activities. The present study considers budgets developed primarily for the first of these purposes.[10] Moreover, the study will be limited to the way in which standards are used in preparing manufacturing cost budgets.

While this series of studies has been based upon practice of 72 companies only 39 of these companies have budgets for planning and coordinating their activities in which use is made of standard costs. Hence the following conclusions are based upon practice of these 39 companies.

Preparation of the Budget

Preparation of the budget begins with a forecast of sales. Using this forecast of sales together with the inventory desired, production requirements for the coming period are set up. Once the

[10] For a discussion of budgets for control of manufacturing expense, see "Standards to Aid Control of Manufacturing Costs," Research Series No. 12, *N. A. C. A. Bulletin*, March 15, 1948, p. 925.

quantity of goods to be produced has been ascertained, the next step is to determine the cost to manufacture these goods. Such a calculation of manufacturing costs is needed to provide the cost of sales and inventory figures in the budgeted statements. Since budgets are based upon estimates, past experience, or upon standards, the accuracy of the resulting budget will obviously be influenced by the reliability of the data which is used in establishing the budget in the first place. Where standards are available they provide a ready means for translating the budgeted production figures into manufacturing costs.[11] The results are also likely to be more reliable than when standard costs are not available. As stated in "A Reexamination of Standard Costs" with respect to the use of standard costs in preparation of a budget:

"The reliability of standard costs stems from the fact that they have been based upon careful studies of material usage requirements, operation methods and times, variability of cost with volume, and the best arrangement of equipment. Furthermore, the standards have been tested and performance under them has been recorded so there is a good basis for predicting what performance can be expected in the future."[12]

Forecasting Variances from Standard Costs

Standards used to control operating performance are often tighter than expected actual performance so that a net debit variance usually is anticipated. Variances from standard or normal volume and perhaps variances from standard cost prices which will be in effect during the coming budget period may also be anticipated. In order that budgets may reflect expected actual results, a majority of the companies interviewed forecast variances from standard costs when preparing their budgets. In the group of 39 companies, 28 companies forecast variances while 11 companies do not do so. As stated by one company:

"The standards set for standard costs are not always attained, due either to failure to procure the normal volume or mixture of sales, or the failure to conduct our activities on a basis that

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[11] Several of the companies interviewed which prepare a budget but do not use standard costs for this purpose budget cost of sales as a percentage of sales. In these cases no detailed breakdown of manufacturing costs is made for purposes of the budget.

[12] Research Series No. 11, *N. A. C. A. Bulletin*, Feb. 1, 1948, p. 715.

resulted in the attainment of standard allowed performance. The final financial budget will therefore include an estimated amount indicating these anticipated variances."

These forecasted variances are, to some extent, an indication that standards for control are kept tighter than estimates used for planning. They also represent allowances for standards which have not been revised to give effect to expected actual conditions. This is often true of overhead volume standards and to a lesser extent of other standards.

The companies which do not forecast variances follow either of two procedures which give results which are essentilly the same. In the first case, a forecast of purchase prices and volume is made for purposes of the budget. New standard costs are then set on the basis of the forecast. On the other hand, some companies first revise their standard costs and then use the revised standards to prepare the budget. With both methods standard costs and budgets represent what the company expects to accomplish and no variances are planned.

Budgeting Material Requirements

The budget for direct material requirements is built up from the material quantity standards and the forecasted production of each product. On this basis a purchasing schedule is prepared in order to have needed material available at the proper time. These purchases enter into the cash budget. Total cost of material to be used, regardless of whether it is to come from present inventory or future purchases, becomes an element of cost of goods to be manufactured.

A majority of the companies reported use of their material quantity standards for this purpose without modification or adjustment. However, in a few cases where standards are not current or variances have been large some allowance is added to or subtracted from the standard in budgeting material requirements.

Quantities of material required must be priced in order to obtain the aggregate material cost for the budget. Where material cost price standards have been recently revised and represent current or forecasted prices, the price standards are commonly used for the purpose. However, a number of companies use current market prices for material or adjust price standards before using them in budgeting material cost. In the latter cases price stand-

ards usually do not reflect price changes which are anticipated in the coming budget period.

Budgeting Labor Requirements

Labor requirements are usually budgeted in terms of the number of manhours and type of labor force that will be needed. These figures are obtained in most cases by using labor standards to calculate the time required to produce the goods called for by the production schedule. One writer has described the procedure of his company as follows:

> "Another very important estimate which is directly related to the production budget is the forecast of labor requirements. The chief purposes of a labor budget are:
>
> 1. To enable the personnel department to provide workers when and where they are needed.
> 2. To minimize labor turnover and the losses it causes in time, money, and efficiency.
> 3. To facilitate the estimating of cash requirements for payrolls.
>
> "For many years we have maintained statistical data showing the standard direct labor hours required in each production, inspection, and assembly department to manufacture every model in the various lines. The sources of this information are the make-up records of each model and the operational cost cards. With such information it is possible, within a few hours' time, to determine the number of direct labor hours needed in each department to produce the entire production schedule for the budget period. By adjusting these figures to account for operators' efficiency, absenteeism, scrap, etc., we can make an estimate of the number of hours required in each department to produce the schedule."[13]

In a number of cases adjustment of standards by the current labor performance variance ratio was reported. Since debit labor variances seem to be quite common, it might be expected that such an adjustment would be considered desirable, for the planning budget stresses expected accomplishment.

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[13] Robert Walker, "Synchronized Budgeting in the Business Machine Industry." *N. A. C. A. Bulletin*, August 1, 1947, pp. 1457-58.

In determining the cost of budgeted labor time, companies which revise labor rate standards concurrently with the preparation of the budget use their rate standards, but most companies use current or anticipated labor rates in place of standard rates.

Budgeting Overhead

In preparing the master budget most of the companies interviewed use their standard overhead rates for determining the cost of goods to be produced in the budget period.[14] However, if budgeted volume differs from the volume used in setting the standard overhead rate, some under- or overabsorbed overhead must be allowed for in the budget.

A majority of the companies interviewed break down manufacturing expense into fixed and variable categories in order to aid them in planning allowable manufacturing expenses for the budgeted volume of production. This breakdown is to be found in the flexible budget standards which have been established to control manufacturing expenses. The amount of variable expense is generally taken from the flexible budget, although adjustment for changes in prices and wage rates may be made if these factors are not reflected in the standards. On the other hand, if volume of production called for by the budget is less than that used in developing the overhead standards, fixed expenses are often reviewed, since an indicated volume variance loss can sometimes be reduced by managerial decisions with respect to size of the organization to be maintained and other expenses which are fixed principally by managerial policy.

Relationship Between Planning and Control Budgets

The planning budget sets the goal for the coming budget period. In order that the manufacturing costs may be kept within bounds anticipated by the budget plan, it is necessary that continuous control be exercised over costs during the budget period. The standard costs (including the flexible overhead budgets) serve this function when the standards which were used in construction of the budget are subsequently used for current control.

While actual costs seldom can be kept exactly in line with either standards or budget, it is possible to collect and analyze the vari-

[14] For a discussion of item-by-item budgeting of expenses, see "Standards to Aid Control of Manufacturing Costs," Research Series No. 12, *N. A. C. A. Bulletin*, March 15, 1948, p. 925.

ances in order to show what caused these variances. In this process two comparisons are made, viz., (1) actual cost with standard cost, and (2) actual cost with budgeted cost. The first comparison serves as a measure of current success in control of manufacturing costs while the second shows how successful management has been in operating in accord with the plan set up by the budget. Variances from control standards must, of course, be kept within limits set by any forecasted variances if the budget is to be met.

Reports showing actual costs in comparison with budgeted costs provide management with data which aid in determining when action should be taken to bring performance into line with the budget or to modify the budget. A record of experience expressed in variances from the budgets of previous periods is also helpful in improving the accuracy of future budgets.

Summary Regarding Standard Costs for Budgeting

In the field study it was found that most of the companies which use budgets for planning and coordinating activities employ their standard costs to aid in estimating the costs of manufacturing the goods called for by the budget plan. Standard costs are especially useful for this purpose because they are predetermined product costs ascertained by careful study of cost performance. However, standard costs are commonly based upon normal volume and efficient use of production facilities while budgets reflect expected actual performance under the conditions anticipated. Hence it is usually necessary to include a forecast of variances from standard costs in the budget. By making such a forecast of variances the standard costs can be utilized in building up the cost figures called for by the budget and then adjusted in total by the amount of the variances forecast. In those cases where no forecast of variances is made, the standard costs are revised to incorporate in them the conditions which would otherwise produce variances.